REMARKS

Reconsideration is requested. Claims 1-27 and 30-33 are pending, with claims 1-11 and 30-33 having been withdrawn from consideration by the Examiner. Responsive to the Office Action of March 5, 2001, the Examiner's comments and the cited art have been noted and studied. For reasons to be set forth in detail below, it is respectfully submitted that the present application is in condition for allowance, and such action is requested.

A Substitute Specification has been provided to correct clerical and grammatical errors as well as awkward phrasing. Figures 1 and 2 have been amended to add the legend -- Prior Art --.

Claims 20 and 22 have been amended to clarify awkward language.

It is respectfully submitted that the amendments above are supported by the specification, claims, abstract of the disclosure, and drawings as originally filed, and that no new matter has been added.

35 U.S.C. §112 Rejections:

The subject matter of claims 13 and 14 was rejected under 35 U.S.C. §112. In particular, the Office Action contended that the specification, while enabling for transition metals, does not provide reasonable enablement for Cerium (Ce) and Praseodymium (Pr) since these elements are not transition metals.

Transition elements are defined as those elements that "have partially filled d or f shells." See F. Albert Cotton and Geoffrey Wilkinson, *Basic Inorganic Chemistry*, 203 (John Wiley and Sons, 1976). In addition, all of the transition elements are metals (see *id.* at 203). Ce and Pr have partially filled f shells and are, therefore, transition metals (see *id.* at 448). While Ce and Pr are also lanthanide elements (i.e., elements 58-71), the lanthanide elements are a sub-category of the transition elements (see *id.* at 203). Copies of the relevant pages from *Basic Inorganic Chemistry* are attached.

Applicants point out that there are often multiple collective names that can be applied to a single element. For example, Ce is a metal, a transition metal, a lanthanide, and also a rare earth

metal. Once apprised of the present specification, one of ordinary skill in the art would recognize, however, that Applicants are employing the term "transition metal" in a manner that includes Ce and Pr. See, for example, page 5, lines 13-16, page 8, lines 21-22 and page 15, lines 16-18 of the specification.

For the foregoing reason, Applicants respectfully submit that the subject matter of claims 13 and 14 is allowable under 35 U.S.C. §112.

35 U.S.C. §103 Rejections:

The subject matter of claims 12-27 was rejected under 35 U.S.C. §103(a) as obvious over JP 04-121,964 in combination with JP 04-169,067, U.S. Patent No. 4,791,079 to Hazbun (hereinafter "Hazbun") and U.S. Patent No. 5,474,800 to Matsuzaki (hereinafter "Matsuzaki").

Before discussing each of the references, Applicants point out that the cermet produced by the process recited in claim 12 includes three distinct components: (a) yttria-stabilized zirconia (YSZ) containing a transition metal dissolved therein; (b) nickel; and (c) cerium oxide containing a divalent or trivalent metal dissolved therein. This combination provides multiple unexpected benefits including: (i) enlargement of the electrode reaction field; (ii) excellent performance at high or low operating temperatures; and (iii) prevention of nickel flocculation and subsequent fuel electrode deterioration (see, for example, page 3, lines 14-22, page 9, line 26 through page 10, line 3, and page 12, lines 8-10 of the specification).

JP 04-121,964 (hereinafter '964), as understood from the English language abstract, describes a fuel electrode material for a fuel cell. The fuel cell electrode material can be a cermet in which nickel metal is "carried" by a "mixture" of CeO_2-YSZ. This fuel cell electrode material is said to restrain the precipitation of carbon. '964 does not describe, teach or suggest that YSZ contain a transition metal dissolved therein or that the CeO_2 component contain a divalent or trivalent metal dissolved therein.

JP 04-169,067 (hereinafter '067), as understood from the English language abstract, describes a fuel electrode that includes a solid solution of Ce-oxide and an oxide of alkaline earth metal or rare earth metal in which is dispersed a nickel material. '067 does not contain descriptions or teachings related to the use of YSZ containing a transition metal dissolved therein.

Hazbun, as understood, describes the prior art as claiming the use of stabilized zirconia doped with titanium dioxide for use as fuel cell electrodes (see col. 2, lines 23-46). Hazbun contains no descriptions or teachings related to the use of nickel or CeO_2 component containing a divalent or trivalent metal dissolved therein.

Matsuzaki, as understood, describes a method for forming a Ni-YZS anode (see col. 1, lines 46-50 of Matsuzuki).

The Office Action states that it would have been obvious to modify the '964 electrode material with the components of '067 and Hazbun. Applicants respectfully submit that such a combination of '964, '067 and Hazbun is an unobvious and unallowable hindsight reconstruction of the claimed subject matter.

'067 does not describe the use of YSZ or YSZ containing a transition metal dissolved therein. Therefore, there appears to be no reasonable suggestion in '067 or '964 that the '067 components can be successfully combined with the '964 YSZ-based electrode material. Nor is there a suggestion that such a combination would provide the multiple unexpected benefits of the current invention.

Furthermore, Hazbun contains no descriptions related to nickel or a CeO_2 component containing a divalent or trivalent metal dissolved therein. Therefore, there is no reasonable suggestion in Hazbun or '064 that the Hazbun components can be successfully combined with the '964 Ni and CeO_2-YSZ-based electrode material or that such a combination would provide the unexpected benefits of the present invention.

The suggested combination of '964, '067 and Hazbun appears to be based on the belief that it would have been obvious to try various combinations of the components described therein. Such an obvious to try basis, however, does not meet the standard of 35 U.S.C. §103. In this regard, the Federal Circuit has stated:

> At best, in view of these disclosures, one skilled in the art might find it obvious to try various combinations of these known scale and corrosion prevention agents. However, this is not the standard of 35 U.S.C. §103.

See *In re Geiger*, 815 F.2d 686, 688 (Fed. Cir. 1987).

Matsuzuki was cited for its teachings related to metallo-organic precursors and screen printing and does not cure the deficiencies of '964, '067 and Hazbun noted above.

For at least the foregoing reason, Applicants submit that independent claim 12 is allowable over the cited combination of '964, '067, Hazbun and Matsuzuki. Since dependent claims necessarily contain the limitations of their parents, dependent claims 13-27 are allowable for at least the same reason.

CONCLUSION

Applicants respectfully request that, in light of the amendments and explanations above, the Examiner reconsider and withdraw his rejections. Applicants respectfully submit that the claims are in condition for allowance. In the event that minor claim amendments are necessary to meet formal requirements, Applicants invite the Examiner to telephone the undersigned so that issuance can be expedited.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO THE CLAIMS

20. (Amended) The process for producing the fuel electrode of the solid oxide fuel cell according to claim 12 wherein a concentration of Ni in said cermet is in the range of 20% to 95% [at] as a volume fraction.

22. (Amended) The process for producing the fuel electrode of the solid oxide fuel cell according to claim 12 wherein a concentration of YSZ containing the transition metal dissolved therein in said cermet is in the range of 1% to 50% [at] as a volume fraction.